

REMARKS

Claims 15-16, 18-29 and 34-37 are pending in this application. Claims 15, 16 and 29 are independent.

The present invention provides a resin composition comprising ethylene-vinyl alcohol copolymer ("EVOH") (A), an additional thermoplastic resin (B), and a transition metal salt (C). The ethylene-vinyl alcohol copolymer (A) is contained in an amount of 70 to 99.9% by weight; the thermoplastic resin (B) is contained in an amount of 0.1 to 30% by weight; and the transition metal salt (C) is contained in a ratio of 1 to 5000 ppm. As a result of this combination, the resin composition has excellent gas barrier properties (i.e. low permeability) and excellent oxygen absorption properties (oxygen scavenging function). The oxygen absorption properties result from the presence of oxygen-reactive carbon-carbon double bonds in the thermoplastic resin (B). The transition metal salt (C) improves the oxygen scavenging function of the resin composition by facilitating the reaction of carbon-carbon double bonds with oxygen.

Claims 15-16, 18-29 and 34-37 are rejected under the judicially created doctrine of obviousness-type double patenting over Claims 1-17 of U.S. Patent No. 6,599,598 ("Tai-598"). In addition, Claims 15-16, 18-29 and 34-37 are rejected under the judicially created doctrine of obviousness-type double patenting over Claims 1-25 of U.S. Patent No. 6,759,107 ("Tai-107").

Claim 7 of Tai-598 recites "an ethylene-vinyl alcohol copolymer having ... a degree of saponification of 90% or more". Similarly, Claims 7 and 21 of Tai-107 recite "an ethylene-vinyl alcohol copolymer having ... a degree of saponification of 90% or more".

However, the claims of Tai-598 and Tai-107 are silent about an upper limit for the degree of saponification of the EVOH.

Any *prima facie* case for the obviousness of Claims 15-16, 18-29 and 34-37 based on Claims 1-17 of Tai-598 and Claims 1-25 of Tai-107 is rebutted by the significant improvement in adhesion achieved by the present invention with a resin composition containing EVOH having a range of degree of saponification of 90 to 99% (i.e., independent Claim 1: "a degree of saponification SDa (%) of the ethylene-vinyl alcohol copolymer (A) ... [satisfies] ... $90 \leq SDa < 99$ "; and independent Claims 16 and 29: "degrees of saponification $SDa1$ (%) ... of the ethylene-vinyl alcohol copolymers (al) ... satisfy ... $90 \leq SDa1 < 99$ ").

The resin composition of the present invention contains at least one EVOH having a degree of saponification in the range of 90 to 99%. As a result, the resin composition has good adhesion to other resins, even in the absence of any adhesive resin. When a multilayer container is produced in which a layer of the resin composition of the present invention is in direct contact with a layer made of other resins, such as PES, the multilayer container has sufficient impact delamination resistance. See, e.g., specification at page 9, lines 2-10.

The significant improvement in adhesion (i.e., reduced "delamination incidence rate") achieved by the present invention is demonstrated in the specification at Table 2-4, which are reproduced below.

Table 2

EVOH	Ethylene content (mol%)	Degree of saponification (%)	MFR (g/10 min) * ¹	Content of phosphoric acid radicals (ppm) * ²	Content of sodium salt (ppm) * ²	Content of potassium salt (ppm) * ²	Content of magnesium salt (ppm) * ²	Refractive index	Haze value (%)
A-11	44	97.5	12.6	80	75	35	25	1.528	0.7
A-12	44	96.5	12.2	85	70	33	25	1.528	0.5
A-13	32	97.5	7.7	75	50	50	5	1.532	0.9
A-21	44	99.8	13.7	100	80	50	50	1.528	1.0
A-22	32	99.8	8.0	90	50	60	20	1.533	1.1

*1 : 210°C-2160g load

*2 : in terms of metal element

Table 3

	Resin composition					
	EVOH(A)				Thermoplastic resin (B)	Transition metal salt (C)
	EVOH(a1)	parts by weight	EVOH(a2)	parts by weight	(parts by weight)	(ppm) * ³
Example 1	A-11	96.5	—	—	3.5	200
Example 2	A-12	19.5	A-21	78.0	2.5	200
Example 3	A-12	38.0	A-21	57.0	5.0	200
Example 4	A-12	19.2	A-22	76.8	4.0	200
Example 5	A-13	95.0	—	—	5.0	200
Comparative example 1	—	—	A-21	100.0	—	—
Comparative example 2	—	—	A-21	97.5	2.5	200

*3 : in terms of metal element

Table 4

	Resin composition			Multilayerd film		Bottle	
	MFR (g/10 min) * ⁴	Haze value (%)	Oxygen absorption rate (ml/m ² ·day)	Haze value (%)	Haze value (%)	Oxygen transmission rate (ml/container·day·atm)	Delamination incidence rate (%)
Example 1	11.8	1.0	1.620	2.2	2.0	0.00	12
Example 2	12.7	1.2	1.176	2.5	2.3	0.00	8
Example 3	12.0	1.1	1.398	2.3	2.1	0.00	17
Example 4	8.7	1.4	0.883	2.6	2.4	0.00	19
Example 5	7.2	1.1	0.993	2.3	2.2	0.00	14
Comparative example 1	—	0.9	0.000	2.1	2.1	0.03	64
Comparative example 2	13.5	1.5	1.104	2.7	2.5	0.00	89

*4 : 210°C-2160g load

Tables 2-3 show that the degree of saponification of the EVOH in both Examples 1 and 5 is 97.5%, and that the degree of saponification of the EVOH(a1) in Examples 2, 3 and 4 is 96.5%.

In contrast, Tables 2-3 show that the degree of saponification of the EVOH in both Comparative Examples 1 and 2 is 99.8%.

Table 4 shows that the delamination incidence rate of Examples 1-5 ranges from 8 to 19%. In contrast, the delamination incidence rate of Comparative Examples 1-2 ranges from 64 to 89%.

Thus, Table 4 shows that the adhesion in Examples 1-5, which contain EVOH having a degree of saponification in the range of 90 to 99%, is significantly greater than the adhesion in Comparative Examples 1-2, which contain only EVOH having a higher degree of saponification of 99.8%.

Because the claims of Tai-598 and Tai-107 fail to suggest the significant improvement in adhesion that is achieved by the present invention with a resin composition containing EVOH having a degree of saponification in a range of 90 to 99%, any *prima facie* case of obviousness based on the claims of Tai-598 and Tai-107 is rebutted. Thus, the obviousness-type double patenting rejections should be withdrawn.

The Office Action cites U.S. Patent No. 6,447,858 ("Shimo"). Applicants confirm that Shimo and the above-identified application are commonly assigned to Kuraray Co., Ltd.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' representative at the telephone number listed below.

Respectfully submitted,

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